



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,685	06/20/2003	Sung-Kee Kim	5000-1-363	6740
33942	7590	11/19/2007		
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			EXAMINER LI, SHI K	
			ART UNIT 2613	PAPER NUMBER
			MAIL DATE 11/19/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/600,685	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> Shi K. Li	<b>Art Unit</b> 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2007.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ono et al. (U.S. Patent 6,097,525).

Regarding claims 1 and 12, Ono et al. teaches in FIG. 8 a duobinary optical transmission apparatus comprising a light source (semiconductor laser) 1, an NRZ optical signal generator 2 for outputting a NRZ optical signal to optical phase modulator 3, which generates duobinary optical signal. Ono et al. teaches in FIG. 10A-10D the amplitude and phase of the signals. FIG. 10D teaches that the '1' bits (the second and fourth bits from the right) located at both sides of a '0' bit (the third bit from the right) have different phases (the second bit has phase 0 and the fourth bit has phase  $\pi$ ).

Regarding claim 13, Ono et al. teaches in col. 7, lines 35-38 optical fiber.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2613

4. Claims 2-4, 7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. (U.S. Patent 6,097,525) in view of Miyamoto et al. (U.S. Patent 7,116,917 B2).

Ono et al. has been discussed above in regard to claims 1 and 12-13. Regarding claim 2, the difference between Ono et al. and the claimed invention is that Ono et al. does not teach in FIG. 8 a plurality of driving amplifiers. However, Ono et al. teaches in FIG. 15 driving amplifiers 21. Furthermore, the Examiner cites Miyamoto et al. for teaches driving amplifiers in FIG. 2. One of ordinary skill in the art would have been motivated to combine the teaching of FIG. 15 of Ono et al. or Miyamoto et al. with the optical transmission apparatus of Ono et al. because the driving amplifiers adjust the signal intensity to achieve desirable modulation depth. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include driving amplifiers for adjusting desirable modulation depth, as taught by FIG. 15 of Ono et al. or Miyamoto et al., in the optical transmission apparatus of Ono et al.

Regarding claims 3 and 10, FIG. 15 of Ono et al. teaches second modulator driving amplifiers.

Regarding claims 4 and 7, FIG. 15 of Ono et al. or FIG. 2 of Miyamoto et al. teaches Mach-Zehnder modulator.

Regarding claim 11, Miyamoto et al. teaches in FIG. 10 pulse pattern generator 71.

5. Claim 5-6, 8-9 rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. and Miyamoto et al. as applied to claims 2-4, 7 and 10-11 above, and further in view of Wooten et al. (Wooten et al., "A Review of Lithium Niobate Modulators for Fiber-Optical Communication Systems", IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6, No.1, Jan/Feb 2000).

Art Unit: 2613

Ono et al. and Miyamoto et al. have been discussed above in regard to claims 2-4, 7 and 10-11. The difference between Ono et al. and Miyamoto et al. and the claimed invention is that Ono et al. and Miyamoto et al. do not teach the various cut of a Mach-Zehnder modulator. However, various cuts for Mach-Zehnder modulators are well known in the art. For example, Wooten et al. teaches in FIG. 3 and Table 1 x-cut and z-cut Mach-Zehnder modulators. One of ordinary skill in the art could have combined the teaching of Wooten et al. with the modified optical transmission apparatus of Ono et al. and Miyamoto et al. because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use z-cut or x-cut single armed or dual armed Mach-Zehnder modulator, as taught by Wooten et al., in the modified optical transmission apparatus of Ono et al. and Miyamoto et al. because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

6. Claims 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. (U.S. Patent 6,097,525) in view of Penninckx et al. (U.S. Patent 6,563,623 B1).

With respect to claim 14, Ono discloses the method as claimed in claim 12, however, Ono fails to disclose a variable extinction ratio. Penninckx, from the same field of endeavor discloses the step of changing a dispersion factor of the optical fiber by adjusting an extinction ratio and a chirp variable of the modulator (abstract, control phase optical signal complementary phase and/or power modulation so as to respectively modify its extinction ratio and/or apply a transient "chirp" to it) (column 3 lines 46-49 (adjust the extinction ratio at the transmitter)). Penninckx also uses Mach-Zehnder modulators (column 4 lines 26-43) as was taught by Ono.

Art Unit: 2613

The motivation for doing so would have been to reduce noise-generated degradation (Penninckx: column 3 lines 46-47) and to make the system more flexible to use (Penninckx: abstract) by making it easier to optimize for each type of optical link and for each transmission distance (Penninckx: column 4 lines 1-2).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/600,685

Page 6

Art Unit: 2613

skl

14 November 2007

A handwritten signature in black ink, appearing to read 'SKL' with a stylized flourish at the end.

**Shi K. Li**  
**Patent Examiner**